



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

admits that plants show a life as active, and a sensibility as great as do most animals.¹ Any disturbance of the conditions under which plants thrive are as fatal as the subversion of the relations upon which the lower animals and man himself depend for existence.

In the investigation of this part of our subject, we must remember that we cannot see exhibitions as great as in the more complex forms. Each plant, transitional or not, displays in the struggle for existence and the survival of its kind, a force, an influence almost as great and wonderful as is exhibited by mankind. And though standing above all this, as head and chief, man is too often forgetful of the relation he bears to the innocent weed that is in the pastures bred; too thoughtless, many times, of the vegetable on which he depends for his subsistence and being; too ignorant of the chain which leads from the lowest vegetable form, to the beauty and perfection of his manhood.—[*To be continued.*]

—:O:—

THE DISCOVERY OF "TURTLE-BACK" CELTS IN THE DISTRICT OF COLUMBIA.

BY W. J. HOFFMAN, M.D.

ALTHOUGH the rude stone implements forming the subject of this paper were not found under such circumstances as to assign to them the age that some have suggested, yet the term "turtle-back" is retained for the purpose of distinguishing them from the ordinary modern rude forms, and to illustrate their relationship to some extent to the older and *typical* specimens described and figured by Dr. Abbott.² Before giving a description of the implements, the locality of their discovery will be necessary. The surface thus far examined, covers an area of less than two acres in extent, and is situated on the left or south bank of the eastern branch, in Uniontown, D. C., about an eighth of a mile above the bridge connecting that town with Washington city. From the branch southward, the surface gradually rises in elevation, and the region upon which the chief specimens were

¹ Loc. cit.

²Am. Nat., x, p. 331; Tenth Ann. Rep. Peabody Mus. Am. Archæol. and Ethnol. II, pt. 1, 1877. pp. 30-43, figs. 1-3; Eleventh Ann. Rep. Mus. Am. Archæol. and Ethnol. II. pt. 2, 1878, pp. 223-257, figs. 1-4.

found is about fifteen feet above low water mark. This sloping surface consists of fine sand, resting upon a layer of water-worn pebbles of stratified drift. The latter is a continuation of the formation known as the "cobble-stone" drift, upon which the eastern portion of the city of Washington is built. At several localities in that portion of the city, street cuts show exposures varying from five to forty feet in thickness. The several layers of worn and rounded boulders, "cobble-stones," gravel and sand, retain a perfect uniformity of stratification, showing their original deposition and arrangement through the action of water. Upon nearing the Branch we reach the shallow valley worn by that current, and the upper stratum of drift though much lower than farther back in the city, is not low enough to reach the level of that stream even at high tide. Examinations indicate, however, that the upper stratum on the north side of the stream, and the stratified gravel at the locality where the implements occur are the same, their continuity having been destroyed by the body of water just mentioned.

The rude implements were found about one hundred and fifty yards from the edge of the water, associated with quite a variety of more modern manufacture, which, by the way, were, with the exception of two or three examples, all made either of white, vitreous, or nearly transparent quartz. These represent spear-heads, arrow-heads and scrapers of great variety of sizes; some of the latter consisting of split pebbles, nicely finished by chipping, leaving the convex side to retain nearly all of the original surface. Many of the arrow-heads have been manufactured in this way, by cleaving the pebbles and finishing up a few irregularities. The smallest specimens are represented by scrapers, probably used in smoothing down arrows; these are made of tabular pieces of *semi-transparent* quartz, about the size of a five cent nickel, shaped nearly like a horse-shoe, flat at base, and have the opposite convexity nicely beveled.

The next class of implements represent manufacture of a ruder character, and undoubtedly points to greater age; to the earlier and lower state of the art of working stone for pointing weapons. These consist of quartz, and rarely chert, being rudely chipped and flaked, always leaving a greater irregular convexity upon one side of the specimen than upon the other, forming an intermediate grade between the modern forms and those termed "turtle-backs."

The latter is the class to which I desire to call special attention. These lie scattered along various small ravines formed by the rain, mingling with pebbles and modern relics *ad libitum*. They are all made of characteristic yellowish or grayish-brown quartzite, a material used in every instance, which has not been found to occur in a single individual of the two preceding varieties. In form they are true "turtle-backs," if the term is admissible. The variety of forms thus far discovered are represented by that undefinable shape usually termed *celts*, and spear-heads.

An examination of a celt gives the following measurements, in inches: length 4.6, width (greatest) 2.4, thickness 1.85. The anterior surface, or that side upon which we find the "turtle-back" elevation, rises to 1.38 above the average line of the cutting edge; while the posterior or opposite side rises to but .47 of an inch beyond the same line. The top of the greater elevation retains part of the natural worn surface of the cobble-stone from which the specimen was wrought, showing the implement to have been manufactured near the locality. The cutting edge though still sharp, is very undulating, owing to the removal of large flakes during manufacture. Secondary chippings, ending in a perfectly continuous edge, shows the relic to have been a complete specimen and not a core, as has been suggested upon the discovery of similar forms. Another reason is, that not a single arrow-head or other specimen has as yet been found, even upon the closest examination, although the flakes would serve to furnish materials for arrow-heads, which could measure, when finished, nearly two inches in length. Considering the nature of quartzite, such utilized flakes should be found, as no disintegration or decomposition could obliterate their form so long as the bodies from which they have been flaked fail to present any changes upon their surface.

The only spear-head found, thus far, presents the same peculiar irregularity, but is especially interesting on account of its great comparative thickness. The specimen is 2.5 inches in length from the projection on the base to the point, 1.8 of an inch broad, and 1.2 thick. The cutting edge is sharp, continuous all around, and slightly undulating, the latter being the result of flaking. Secondary chippings are visible at different points. The anterior lateral cutting edges converge at an angle of 90°, terminating in an extremely delicate and acute point. The "turtle-back" eleva-

tion reaches its extreme elevation less than half an inch back of this, forming an angle of 64° when viewed from either side. Toward the base the descent is more gradual, where there are deeper notches than usually occur, the projections on either side somewhat worn, showing traces of having been used. From all appearance such an implement, as nearly all of this type, appears useless in attempting to penetrate the skin of anything more resisting than that of fishes.

It is very probable that these rude implements were not manufactured and employed by the Indians of historic times who inhabited this region. The question is asked, Why then do these implements occur with more modern ones upon the surface, or in washes? The only reason that can be given is, that the rude forms occupying that portion of the stratum of sand resting upon the gravel, and those of modern manufacture occupying the surface of the later deposit of earth and sand, were brought together by the removal of the intervening siliceous matter through the prolonged and repeated agency of rains. Thus the surface relics were gradually let down, as it were, as the sand and earth were washed away. This may appear unsatisfactory, but the suggestion is based upon the following reasons: *first*, that the sand being fine and easily removed by water (through the agency of rains) falling over this locality and over the bluffs, follows the most natural course towards the stream, taking with it the light silicious particles, and washing them away from the pebbles, stones and implements, allowing them to be deposited in an indiscriminate mixture in the little water courses and ravines; *second*, that this has been the case is apparent from the fact of its occurrence in several places at this time; also that small embankments and hillocks occur, consisting of gravel thus deposited or brought together by the removal of the lighter soil; and at this day, after any continued or hard rains, numerous accumulations of pebbles, amongst which we find implements, are formed by the removal of earth and sand by the temporary streams.

In this way the surface remains have not been carried away from the localities upon which they had rested, but were gradually dropped to a lower horizon, until after a time they reached the stratum containing the rude and more ancient varieties.

In this connection I shall speak of several localities in Pennsylvania, one of which occupies a position in the eastern portion

of the city of Reading, and another a short distance below that city. The rude implements found at these places have been remarked upon by Mr. A. F. Berlin in a recent number of the *American Antiquarian*.¹ The first named locality is the one upon which Mr. Berlin first noticed the occurrence of rude implements bearing the typical characteristics of so-called "turtle-backs." A few days after this discovery I visited the place, and found various examples, consisting of "celts," spear-heads, arrow-heads and scrapers. These were found over a small area only, occupying the top of a small limestone bluff. A small stream known as Mineral Spring creek passes near the base of this bluff, the intervening soil consisting of loam and d bris from the more elevated regions. Immediately above, and resting upon the stratum of limestone, is a stratum of sand and pebbles, which has been washed away along the immediate declivity of the embankment, exposing the rude relics above referred to as found by Mr. Berlin. I found that this stratum of sand was covered by earth and gravel from the neighboring hillside, with which it was continuous, excepting along the greater declivity where the rain had worn away the super-stratum, exposing the sub-stratum of sand and rounded and worn pebbles, which occurred in accumulations where they had been washed into the ravines. Modern types were also found here associated with the rude implements, but the latter were not found on the upper stratum, even where the ploughing of long continued cultivation and local denudation has removed considerable soil ; but farther down the modern forms have been washed down and lowered by the removal of sand and earth to reach the more ancient stratum containing the "turtle-backs."

This stratum of sand and gravel, or, more properly speaking, pebbles, continues eastward horizontally, as was proven by the digging of a well. Nearer the hill, where this excavation was made, the workmen reached a layer of stratified sand, pebbles and cobble-stones at a depth of about forty feet. Upon examination this proved to be the level (if run horizontally towards the bluff) of the one containing the implements. Since then this stratum has been detected along the valley a short distance, proving it to be the same, the great amount of d bris and soil from the mountain side being accounted for where the well was

¹ Vol. i, No. 1, 1878, pp. 10-12, pl. facing p. 16.

dug, because that lies nearer the slope which rises at an angle of about 16° . This fluvatile drift, as it seems to be, formed the bed of an ancient body of water; but whether the implements found date to that period or a little later, it is impossible to decide. Were it possible to continue the search by digging at various places and depths to ascertain if the implements occur elsewhere than at the bluff, more might be learned, though it is very improbable, as will be shown farther on.

Dr. F. M. Endlich informs me of the occurrence of ancient shore lines on the eastern declivity of the neighboring hills, which may mark the surface of the same stratum occurring on the western side, as the continuation may be traced interruptedly around the hills, following the course of the Schuylkill river. The implements found at the last named locality present no appreciable difference from those occurring at Uniontown. Their conformation, mineralogical composition, typical workmanship and even the color of the materials correspond in all respects. Forms from Reading are figured in the *American Antiquarian*¹ by Mr. Berlin. Some in my possession are identical in form, but several are more typical of that class found in the drift at Trenton by Dr. Abbott, and the illustration² given by him represents one celt perfectly. This striking similarity is certainly remarkable; and considering the persistence with which the New Jersey celts are reproduced at Reading and at Uniontown, there appears to be greater relationship between the manufactures of the three varieties than has been accredited, or that we may be able to account for. One, and it may be considered the strongest objection to this suggestion, is, the difference in altitude above the tide water between the several localities. Another is in regard to the geological positions of the implements.

In another locality, one mile south-west of Reading, on the right bank of the Schuylkill river, numerous specimens of these similar rude implements have been obtained. They likewise consist of the same species of quartzite, and are typical "turtle-backs." This locality covers about two or three acres in extent, sloping very prominently towards the river. The soil is sandy, and differs in this respect from that lying immediately around it, has been under cultivation for the last sixty or seventy years, and

¹ Vol i, No. 1, pl, facing p. 16, figs. 1-3.

² Tenth Ann. Rep. Peabody Mus., i, 1877, p. 33, fig. 1, a-b.

through the repeated plowing, harrowing and the effects of rain, much of the original super-stratum have been removed, exposing the older layer of stratified sand and river gravel. With the latter we find more of the rude implements, which consist of celts, spear-heads, arrow-heads and scrapers.

In all of the localities referred to, a peculiar variety of quartzite has been employed, which was found to exist in the "cobblestone" drift in the District of Columbia. At Reading we do not find it, nor within forty miles of that city, to my knowledge. In each of these regions, the specimens partake of a character of workmanship that is rude and primitive in the extreme, and just such implements as might reasonably be supposed to be required by a rude and primitive people.

Assuming that such a race preceded the Indians—of which there is scarcely any doubt—several important points present themselves which are difficult of solution, viz: *First*, the length of time that elapsed between the disappearance of one race and the appearance of their successors; *second*, at what approximate period the manufacturers of the rude implements occupied these regions; and *third*, whether the colony occupying the region about the Eastern Branch, was of immediate tribal connection of those whose remains survive at Reading?

In answer to the first point, nothing can be definitely known, though it would appear from slight geological evidence, that considerable time had elapsed. Various traditions have been handed down to us regarding a race corresponding to the Eskimo, which, if accepted, would allow scarcely any time for the soil to have been without occupants; for that race was, according to said tradition, driven northward by the encroachments of the Indians.

Regarding the second point, the locality in the eastern portion of Reading furnishes the greatest antiquity. Here the original stratum, in one section of which implements have been found in such a condition and under circumstances to lead us to infer that they had been buried there by the gradual accumulation of detritus from the mountains; but whether any specimens occur in the stratum of drift, at any distance under this upper accumulation, is not known. The excavation, showing the drift stratum at forty feet below the surface, is nearer the mountain, and the mass of earth and dèbris may have required but a short time for deposition geologically. Beyond this elevation the valley was, at some

remote time, submerged, but has become narrowed down through the same agency from different directions. Being guided by the manner in which the implements were found, and other meagre evidence, one would suppose them to date back to the lacustrine period, but in this we find difficulties which can be explained in answer to the third point.

The difference in elevation between this locality and that on the banks of the Schuylkill river (as well as that on the Eastern Branch) is too great for them to have been occupied simultaneously, unless we throw out the suggestion of a lacustrine period. Acting upon this, the matter becomes more comprehensible, from which may be deduced the following propositions, viz :

1st. That the three localities were occupied by a similar people, at or nearly at the same time.

2d. That these people lived chiefly upon fish, as is inferred from the implements which, under *ordinary* circumstances, would be worthless in the chase.

3d. That these typical forms of rude workmanship, indicate greater antiquity than we find represented in the rudest forms of Indians who subsequently occupied the same localities. And—

4th. That the position of some of the implements in the stratified drift, and their relation in this respect to the location of modern relics, indicates an indefinite lapse of time from the disappearance of this primitive race to the appearance of the Indians proper, whose rudest forms of workmanship are found near or upon the surface.

—:O:—

RECENT LITERATURE.

BREHM'S ANIMAL LIFE.¹—The volumes that have been previously noticed of the series, have related to the vertebrate animals, which are naturally in a work of a thoroughly popular character such as this, treated of at much greater length than the invertebrates. The present volume has been written by Prof. Oscar Schmidt, of the University of Strasburg, who is distinguished for his knowledge of the structure and mode of development of the lower animals.

This volume begins with the Crustacea, and descends through

¹ *Brehm's Thierleben*. Allgemeine Kunde des Thierreichs. Grosse Ausgabe. Zweite umgearbeitete und vermehrte Auflage. Vierte Abtheilung. Wirbellose Thiere. Zweite Band. Die Niederen Thiere. Von Dr. OSCAR SCHMIDT. Krebse, Würmer, Weichthiere, Stachelhäuter, polypenartige Thiere, Urthiere. Mit 366 Abbildungen im Text und 16 Tafeln, von JOHANNA SCHMIDT, EMIL SCHMIDT und ROBERT KRETSCHMER. Leipzig, Verlag des Bibliographischen Instituts, 1878. 11 Parts. 40 cents a part, for sale by B. Westermann & Co., New York.